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DOI: https://doi.org/10.1007/s11151-008-9196-6

Posted at the Zurich Open Repository and Archive, University of Zurich
ZORA URL: https://doi.org/10.5167/uzh-174949
Journal Article
Submitted Version

Originally published at:
Crawford, Gregory S; Kwerel, Evan; Levy, Jonathan (2008). Economics at the FCC: 2007–2008. Review of Industrial Organization, 33(3):187-210.
DOI: https://doi.org/10.1007/s11151-008-9196-6

Economics at the FCC: 2007-2008*

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October 30, 2008

Abstract

In any given year, the Federal Communications Commission confronts many issues of interest to economists. This paper summarizes four issues of interest during the last year: Spectrum Auctions, Media Ownership, Quality-Adjusted Cable Prices, and Leased Access. It highlights the role that economic analysis played in each and identifies areas where further research would be fruitful.

*This article was drafted while the first author was Chief Economist at the Federal Communications Commission. The opinions expressed here are solely those of the authors and do not necessarily reflect those of the Federal Communications Commission, its Commissioners, or its staff. We would like to thank Larry White and Tracy Waldon for helpful comments. Correspondence may be sent to Gregory S. Crawford (corresponding author), Department of Economics, University of Warwick, Coventry CV4 7AL, United Kingdom, phone +44 (0)2476 523470, email crawford@warwick.ac.uk; Evan Kwerel, Federal Communications Commission, 445 12th St, Washington, DC, 20554, phone 202-418-2045, email Evan.Kwerel@fcc.gov.; or Jonathan Levy, Federal Communications Commission, 445 12th St, Washington, DC, 20554, phone 202-418-2048, email Jonathan.Levy@fcc.gov.

1 Introduction

The Federal Communications Commission (FCC) is an independent United States federal regulatory agency charged with regulating interstate and international communications by radio, television, wire, satellite, and cable. Its mission is to ensure that the American people have available rapid, efficient communications services at reasonable cost and without discrimination. The Commission has both quasi-legislative and quasi-judicial powers. The former are embodied in "rulemaking" proceedings, typically involving the development or implementation of regulatory policies. The latter are embodied in adjudications, including the review of mergers that involve the transfer of spectrum licenses or authorizations to provide interstate telecommunications services.

Economists play a prominent role in many FCC proceedings. Unlike at the U.S. and E.U. competition agencies, the FCC's 50+ economists are (for the most part) organized within bureaus according to industry specialty.[1] Economists therefore work closely with lawyers and engineers (as needed) on issues as they come before the Commission.[2]

In the last year, there have been many issues of interest to economists, including mergers (Liberty Media/DirecTV, XM/Sirius), the 700 MHz spectrum auction, regulatory reform for Universal Service obligations, issues surrounding "network neutrality" (Comcast/BitTorrent), media ownership rules, and regulatory issues in cable television markets (leased access, wholesale tying, and quality-adjusted cable prices). It is impossible to treat carefully all of these issues; consequently in this article we will focus on four of them: spectrum auctions (especially the 700 MHz auction), media ownership, quality-adjusted cable prices, and leased access in cable markets. These were chosen in part to reflect those issues that most captured the public's attention (700 MHz; media ownership) and in part to highlight how relatively simple economic principles can inform relevant policy-making (quality-adjusted cable prices, leased access).

The remainder of this paper is organized as follows: Section 2 summarizes recent developments in FCC Spectrum Auctions with an emphasis on the 700 MHz auction. Section 3 summarizes the recent media ownership rules and how they related to economic research sponsored by the FCC. Section 4 introduces a measure of quality-adjusted cable prices, and Section 5 describes the recent change in maximum rates for leased access to statutorily-required cable system channel capacity. Section 6 concludes.

[1] Each of the largest bureaus (Media, Wireless Telecommunications, Wireline Competition, and International) has its own Chief Economist and numerous staff economists. The Commission's Chief Economist is located in the Office of Strategic Planning and Policy Analysis and reports directly to the Chairman of the FCC.

[2] Froeb, Pautler, and Roeller (2008) discuss the tradeoffs between a functional and divisional organization for economists within policy organizations.

2 Spectrum Auctions

2.1 Background

The FCC was first granted authority to auction licenses for spectrum in 1993 and, with several exceptions, was required to auction licenses for spectrum in 1997.[3] The general goal for spectrum allocation is to ensure that it is used for the benefit of the national public. The FCC has tried to implement this goal by designing auctions that specify and assign licenses quickly and efficiently, are robust to strategic behavior by bidders, raise significant revenue, and are perceived to be fair, transparent, and objective.

To achieve these goals, the FCC immediately settled on a simultaneous multiple round (SMR) auction design.[4] In an SMR auction, all licenses are available during the entire auction, and bids are accepted until there are no new bids on any licenses. This design facilitates the efficient combining of complementary licenses, substitution among alternative licenses, and allows bidders to develop and implement efficient backup strategies should the auction develop in unanticipated ways. There have been numerous incremental innovations to the basic SMR design over the years.

In the two previous survey articles on "Economics at the FCC", Marx (2006) and Connolly and Kwerel (2007) highlighted several issues of interest to economists in the area of auction design, including auctions with endogenous license characteristics, anonymous bidding, and package bidding. The latter two were implemented in the recently concluded 700 MHz auction.[5] We discuss the motivation for and consequences of these features in what follows, as well as highlight interesting features of the licensing rules and prices across the various components ("blocks") of spectrum sold in the auction.

2.2 700 MHz Auction

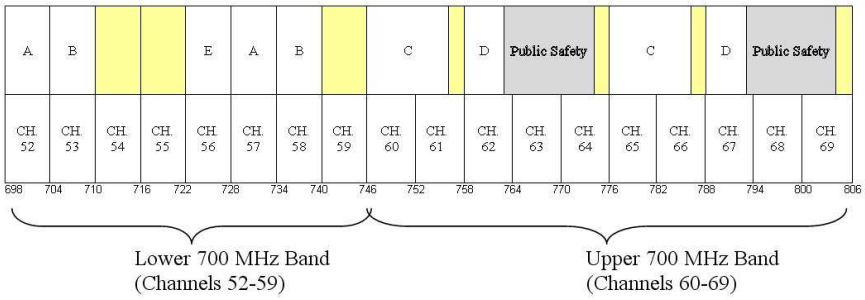
On March 18, 2008, the FCC concluded the auction of 62 MHz of spectrum in the 700 MHz band. This spectrum will be available to the auction winners at the conclusion of the digital transition on February 17, 2009, when all high-power analog television broadcasting will cease. Figure 1 shows the band plan for the auction. The gross revenue from winning bids was $19.12 billion, the largest amount in any single FCC auction. Net revenue, accounting for bidding credits, was $18.96 billion.

[3] Much of this background section borrows extensively from Marx (2006) and Connolly and Kwerel (2007).

[4] With few exceptions, FCC spectrum auction have had an SMR design. See McAfee and McMillan (1996), Cramton (1997), and Kwerel and Rosston (2000) for further discussion of the advantages and disadvantages of SMR auctions.

[5] This is not to minimize the importance of endogenous product choice in an auction context. In a recent FCC working paper, Bykowsky, Olson, and Sharkey (2008) analyze an auction-based approach to selling both spectrum licenses and the licensing rules that apply to that spectrum.

Figure 1: Band Plan for the 700 MHz Auction



Block	Frequencies	Bandwidth	Pairing	Area Type	Licenses
A	698-704, 728-734	12 MHz	2 x 6 MHz	EA	176
B	704-710, 734-740	12 MHz	2 x 6 MHz	CMA	734
C	746-757, 776-787	22 MHz	2 x 11 MHz	REAG	12
D	758-763, 788-793	10 MHz	2 x 5 MHz	Nationwide	1
E	722-728	6 MHz	unpaired	EA	176

Anonymous Bidding and Package Bidding The 700 MHz auction, designated Auction 73 by the FCC, incorporated two new design elements of interest to economists: anonymous bidding and package bidding.[6] With anonymous bidding, the FCC announced only the amount of each bid during the auction, *without* identifying the associated bidders.[7] As discussed in Marx (2006), a considerable body of theoretical economic research supports the view that anonymous bidding inhibits either tacit or explicit collusion among bidders and/or retaliatory bidding to punish a bidder who violates an agreement. (Brusco and Lopomo (2002), Marshall and Marx (2007)).[8] On the other hand, knowledge of bidder identities may promote economic efficiency – for example, by providing information about the technologies that others are likely to deploy on the band.[9] It is hard to measure directly the consequences of anonymous bidding on the allocation or prices of the 700 MHz licenses, since we do not observe the counterfactual outcomes that would have occurred in the absence of anonymous bidding. Whether, and if so how, anonymous bidding changed bidding behavior in the AWS and/or 700 MHz auctions relative to prior "full information" FCC auctions

[6]Marx (2006) also describes the use of anonymous bidding in the auction for Advanced Wireless Services (AWS). Connolly and Kwerel (2007) describe the motivation for and consequences of package bidding as well as experimental evidence on the performance of package bidding in auction contexts.

[7]The FCC withheld, "until after the close of bidding, public release of (1) bidders' license selections on their short-form applications, (2) the amounts of bidders' upfront payments and bidding eligibility, and (3) information that may reveal the identities of bidders placing bids and taking other bidding-related actions." FCC Public Notice, DA 07-4171, "Auction of 700 MHz Band Licenses Scheduled for January 24, 2008," October 5, 2007, available at `http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-07-4171A1.doc`.

[8]Cramton and Schwartz (2000) and U.S. Department of Justice (2006) provide empirical evidence of tacit collusion through bid signaling in previous FCC auctions with full information.

[9]The technology deployed on adjacent licenses can affect the ability to roam and thus the costs of providing inter-operable mobile handsets. The total number of handsets sold using a particular technology on a band can also affect the unit cost of handsets for *all* licensees on the band using that technology.

is an interesting area of further research.

The 700 MHz auction provided for "package bidding" on three pre-defined packages of licenses in the C Block: (1) the "50 States" package containing the eight Regional Economic Area Grouping (REAG) licenses comprising the continental U.S., Alaska, and Hawaii; (2) the "Atlantic" package containing the 2 REAG licenses comprising Puerto Rico, the U.S. Virgin Islands and the Gulf of Mexico; and (3) the "Pacific" package containing the 2 REAG licenses comprising U.S. Pacific territories. Under package bidding, bidders could place bids for individual spectrum "parcels" or for a package of parcels. If the highest individual parcel bids aggregated to more than the highest package bid, then the individual parcel bids would win; if not, then the highest package bid would win.

As it turned out, there were few package bids during the auction. Ultimately, only a single package was won, the Pacific package. Google was the only party bidding on the 50 States package, and it stopped bidding when the reserve price was reached. Verizon bid individually on all 8 REAGs in the 50 States package and won all of them except the Alaska REAG.

While package bidding seems to have made little difference in auction 73 *ex post*, this could not have been known with certainty *ex ante*. For Google, with no existing spectrum holdings and seeking nationwide coverage, the availability of a nationwide package may have been important to their participation in the auction. By contrast, Verizon, as an incumbent with spectrum holdings nationwide, was not subject to the same "exposure" risk of failing to get complete nationwide coverage in the 700 MHz band.[10] Thus the availability of the 50 States package may have reduced exposure risk, facilitating new entry. Further experience with package bidding is required for an understanding of its effects.

Auctions with Conditions: The C and D Blocks One unusual feature of the 700 MHz auction was that the C and D block licensees faced unique regulatory conditions. C block licensees were required to provide an "open platform" for devices and applications. C block customers had to be permitted to use any device and run any applications except when "reasonably necessary" to protect or manage the network.[11] Before the auction, there were concerns that the open platform requirement would reduce a C block licensee's revenue and raise its costs, thereby reducing the amount that a bidder would be willing to pay for a C block license relative to another license with comparable spectrum in the same geographic area.

[10]This exposure risk could also have been mitigated without package bidding if a nationwide license had been designated for the C block. But that approach would have foreclosed the possibility of awarding regional licenses separately to different parties.

[11]Code of Federal Regulations, 27.16. "Use of devices and applications. Licensees offering service on spectrum subject to this section shall not deny, limit, or restrict the ability of their customers to use the devices and applications of their choice on the licensee's C Block network, except: (1) Insofar as such use would not be compliant with published technical standards reasonably necessary for the management or protection of the licensee's network..."

In practice, the open platform requirement may have deterred most bidders from bidding on any C block spectrum, because it may not have been possible to integrate spectrum with an open platform requirement into a single system with other spectrum in the same geographic area that is not operated on the same basis.[12] This problem may explain why AT&T did not seriously bid on the C block.[13] Verizon, the winner of most of the C block spectrum, resolved the system integration dilemma by deciding to provide an open platform for their entire network (Hansell (2007)).

The open platform requirement for the C block was conditional on meeting the aggregate reserve price (of $4.64 billion) for the block. The Commission stated that if the aggregate reserve price was not met for the C block, the block would be re-auctioned without the open platform requirement and with different size licenses. This contingent re-auction format reflected Congressional interest in the auction meeting a revenue target *before* the FCC sacrificed any revenues to attain non-statutory policy objectives, such as an open wireless platform.

From the perspective of economic efficiency, there were two disadvantages of this approach. First, it introduced "lexicographic" preferences for revenue over an open platform. Second, it (potentially) required two auctions, with associated design and implementation costs for each. If there had not been a firm budget target, an alternative approach would have been to provide a *bidding credit* approximately equal to the public benefit (beyond that captured by the licensee) of an open platform. This design would implement the open platform requirement when it is economically efficient – i.e., when the public benefit plus the private value with the requirement exceeds the value of the spectrum without the requirement.[14] A precedent is the FCC's tribal lands bidding credit that is available to any winning bidder when it commits to providing wireless services to qualifying tribal lands.[15]

For the D block, the Commission envisioned a Public Safety/Private partnership between the D block licensee and the public safety licensee for the adjacent 10 MHz of spectrum allocated for broadband public safety communications. The D block licensee was required to build and operate a nationwide interoperable public safety broadband network that operated over the D

[12] Alternatively, it may be possible to operate a single system with an open platform in one geographic area and without it in another area, but open-platform customers may have objected if they could not use their devices and/or applications in areas where such use was blocked.

[13] AT&T made only two bids on the C block: Mississippi Valley in round 18 and Southeast in round 19. Neither bid was a provisional winner, and both were dropped (so that they wouldn't be retained in future rounds when determining the provisional winners under package bidding).

[14] An example provides the intuition for this argument: Suppose that a license is worth $10 billion to bidder A without any restrictions and $0 with them and is worth $5 billion to bidder B (with or without the restrictions), and the bidding credit/public benefit is $3 billion. Under the bidding credit approach, the license will be awarded to bidder A with a total social value of $10 billion. But under a contingent re-auction with a $4 billion reserve price, the license will be awarded to bidder B with a total social value of only $8 billion. See Brusco, Lopomo, and Marx (2008) and Marx (2008) for more discussion.

[15] 47 C.F.R. 1.2110(f)(3), and Third Report and Order, released September 2, 2004, 19 FCC Rcd 17652. A winning bidder may receive a $500,000 credit for each 200 square miles of qualifying tribal land within its license area, subject to a cap based on the gross bid amount.

block spectrum and the public safety broadband spectrum. The network was intended to provide enhanced IP-based data and voice services to police, fire departments, and other first responders. A nationwide network would increase economies of scale, and facilitate seamless interoperability within and across jurisdictions, something that is difficult to do under the current fragmented public safety communications systems operated by thousands of separate jurisdictions. Most of the time the D block spectrum would have been used for commercial services, but in emergencies public safety users would have had priority access. The D block licensee would also have had access to the 10MHz public safety broadband spectrum for commercial use on a secondary, preemptible basis. In practice, the only bid (for $472 million) for the D block license did not exceed its reserve price (of $1.33 billion), and the license went unsold.[16]

Price Differences One striking result in the 700 MHz auction was the difference in the average price per unit of spectrum (measured as the product of bandwidth and population coverage – MHz-pops) across the five frequency blocks. Figure 2 demonstrates that the average winning bid per MHz-pop ranged from $.74 on the E block to $2.67 on the B block.

Figure 2: Average Prices by Block, 700 MHz Auction

700 MHz Auction Results (Auction 73)		
700 MHz Block	Total Provisionally Winning Bids	$'s per MHz-Pop
A	$3,961,174,000	$1.156
B	$9,143,993,000	$2.668
C	$4,748,319,000	$0.756
D	Failed to meet reserve	Not sold
E	$1,266,892,000	$0.739
Total	$19,120,378,000	$1.287

Understanding the reasons for these price differences is important in evaluating the efficiency of the auction mechanism. Price differences for identical items could be a sign of an inefficient auction design because reallocating an item from a party with a lower value to one with a greater value would increase total value. In the case of the 700 MHz auction, the different frequency blocks were not identical, but were *ex ante* sufficiently substitutable to make interesting the question of how much of the price differences could be explained by differences in characteristics of the blocks. Doing so, however, requires a closer understanding of the differences in service rules and technical

[16] After the auction, the FCC issued a Second Further Notice of Proposed Rulemaking to seek comment on possible changes in the 700 MHz D block requirements, including the rules governing public safety access to D block spectrum in emergencies. Second Further Notice of Proposed Rulemaking, released May 14, 2008, 23 FCC Rcd 8047.

constraints across blocks.

As discussed above, the C and D blocks had unique regulatory requirements, making it unsurprising that prices per MHz-pop differed between those and the other blocks. Similarly, the E Block differed from all of the other blocks in that it was unpaired spectrum (a single contiguous frequency block instead of two pieces separated by frequency). This made it less suitable for two-way radio services such as PCS and Cellular that use Frequency Division Duplex (FDD) technology and more suitable for two-way services using Time Division Duplex (TDD) technology or one-way broadcast services such as mobile video, since high power (50,000 watt) fixed-site transmitters were permitted. In many ways, the A and B blocks were the closest substitutes. What then drove the significant price differences shown above?

One important difference between the A and B blocks was that the A Block was divided into 176 "EA" (Economic Area) licenses while the B Block was divided into 734 "CMA" (Cellular Market Area) licenses.[17] Furthermore, the geographic boundaries on the CMA and EA license areas overlapped, so it was not possible to achieve precisely the same coverage area in an EA by aggregating a group of CMA licenses. If it had turned out, contrary to fact, that A block licenses were priced higher than B licenses, it would not have been possible to substitute a group of lower-priced B block licenses with exactly the same coverage. Conversely, it was not possible during the auction to partition the lower-priced EA licenses into smaller geographic pieces that matched the higher-priced CMA licenses on the B block. In other words, even though there were price differences between the A and B blocks, bidders could not easily arbitrage away those price differences because of the differences in license geographic areas. Another important difference between the A and B blocks was potential adjacency effects. The A Block is adjacent to television channel 51. Operating transmitters on the A Block (channel 52) could interfere with televisions that are receiving channel 51 (Television channel 51 operates in 41 of the A Block license areas, including Chicago.) Furthermore, its adjacency to unpaired Block E where up to 50,000 watts of base station power is allowed rather than the normal 1,000 watts (2,000 in rural areas) in the paired bands may have lowered the perceived value of A block licenses.[18]

While not a substitute for detailed statistical analysis, at first blush it looks as if differences in technical factors, license configurations, and license obligations drove much of the price differences in the 700 MHz auction. Measuring the prices per MHz-Pop within and across markets and FCC auctions and relating those to features of the market, time period, and (especially) license rules

[17] It is not obvious a priori whether smaller or larger license areas are likely to bring higher bids. Smaller license areas may fit better with holes in incumbents' service areas or with small regional networks, while larger licenses present reduced exposure risk for bidders that are trying aggregate large geographic coverage.

[18] To reduce this problem, the rules require that such high power stations reduce their emissions (power flux density) on the ground to the same level as would occur if the station were working with the "normal" amount of power. This will help, but the higher power in the adjacent block will still create a more challenging interference environment for Block A than for Block B, and so may have contributed to the lower relative price.

and auction design is a fruitful area for further research.

Efficient Design of Package Bidding Mechanisms The FCC is always seeking to improve its auction designs. It may be useful for economists to analyze how various features such as license specifications and package bidding mechanisms affect the auction efficiency. For example, would an auction of more fungible licenses with common rules, common license areas across blocks, and a simple package bidding design (e.g. limited to nested, non-overlapping "hierarchical" packages) better facilitate efficient substitution across blocks and combining of licenses without excessive risk to bidders that are seeking to acquire larger footprints? To what extent would such a design eliminate price differences not based on differences in spectrum characteristics or regulatory requirements?

One of the many challenges in choosing a package design is the treatment of "old bids" that are not currently provisionally winning. In the package bidding for the C block in the 700 MHz auction, the FCC decided to "consider" all bids from all previous rounds in determining the provisionally winning bids. This provides a bidder with the knowledge of the bids available to combine with its bids to beat collectively a provisionally winning package bid.[19] Holding bidders to all old bids also ensures that prices always rise in the auction. Not holding bidders to all old bids and allowing prices on individual licenses to fall to the minimum opening bid when beaten by a package bid would provide the opportunity for bidders to maintain bidding eligibility without raising total auction revenue by repeatedly bidding on individual licenses likely to be beaten by a package bid (so-called "parking").

On the other hand, retaining all bids may result in a bidder's winning a license it no longer wants when one of its old bids is combined with a new bid to beat a package bid. To avoid this latter problem, the FCC permitted bidders to "drop" non-provisionally winning bids on C block licenses in a single round of the bidder's choice. Another way to avoid this problem of bidders winning "too many" licenses is to allow them to specify mutually exclusive bids (e.g., "I want either license A or B, but not both"). Unfortunately, permitting mutually exclusive bids adds significantly to the complexity of the auction design.

3 Media Ownership

3.1 Background

Pursuant to the 1996 Telecommunications Act, the FCC must review its broadcast ownership rules at fixed intervals: initially every two years; currently every four years. The purpose is to "determine

[19] This helps overcome the "threshold" problem discussed in Connolly and Kwerel (2007).

whether any such rules are necessary in the public interest as the result of competition." The FCC is directed to "repeal or modify any regulation that it determines is no longer in the public interest."[20]

The FCC's previous broadcast ownership rules review, completed in 2003, adopted substantial revisions to the local television station ownership rule, the local radio station ownership rule, the radio-television ownership rule, the newspaper-broadcast cross-ownership rule, and the national television station ownership limit. Federal Communications Commission (2003) (the "2002 Biennial Review Order") describes the rules as they were prior to the 2002 review and the revisions.[21]

The most relevant of these rule changes (given subsequent developments) was the newspaper-broadcast cross-ownership rule. In its 2002 Biennial Review Order, the FCC concluded that the flat ban on newspaper-broadcast cross-ownership did not serve the longstanding policy goals of competition, diversity, and localism. It found that newspapers and broadcast stations did not compete in the same economic market; hence the rule was unnecessary to promote competition. The FCC found that the rule was unnecessary to promote diversity of viewpoint, given the substantial range of media outlets available in many markets and the conflicting evidence in the record on whether ownership influences the viewpoints expressed via a media outlet. With respect to localism, the FCC found that efficiencies from newspaper-broadcast cross-ownership can actually promote localism and increase the quantity of local news and public affairs programming (based on a review of the experience of newspaper-broadcast combinations that were "grandfathered" when the rule was adopted in 1975 or that exist due to waivers of the rule).

The FCC's decision was appealed, and in June 2004 the Third Circuit Court of Appeals affirmed certain FCC findings, including that a blanket prohibition of newspaper-broadcast cross-ownership was not in the public interest. However, the court stayed the effectiveness of the rule revisions and remanded them to the FCC for further justification or modification, since it found that the "cross-media limits" that the 2002 Biennial Review Order adopted to replace the newspaper-broadcast and radio-television cross-ownership rules were not supported by reasoned analysis.[22] In September 2004, the court allowed certain revisions to the local radio ownership rules to take effect. Prior to the court's decision, Congress had passed legislation to revise the national television station ownership cap (at 39%); as a result, that rule was not evaluated by the court nor reviewed in the FCC's 2006 quadrennial review.[23]

In 2006, the FCC began a new review of the existing ownership rules. As part of this review, it

[20]See 2006 Quadrennial Review Order, para. 1.

[21]See 2002 Biennial Regulatory Review - Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996, Report and Order and Notice of Proposed Rulemaking, MB Docket No. 02-277, MM Docket Nos. 01-235, 01-317, 00-244, 03-130, 18 FCC Rcd 13620 (2003), aff'd in part and remanded in part, Prometheus Radio Project v. FCC, 373 F.3d 372, 435, stay modified on rehearing, No. 03-3388 (3d Cir. Sept. 3, 2004) ("Prometheus Rehearing Order"), cert. denied, 545 U.S. 1123 (2005).

[22]Ibid, paras. 9, 15-16.

[23]See 2006 Quadrennial Review Order, paras. 1-4.

commissioned ten Media Ownership studies to facilitate its decision-making: three by FCC staff and seven by outside experts. These studies were published on July 31, 2007. The content of the individual studies was summarized in Connolly and Kwerel (2007).

3.2 The New Rules

In December 2007, the FCC completed its quadrennial review of its broadcast ownership rules. The Report and Order and Order on Reconsideration in MB Docket No. 06-121 ("2006 Quadrennial Review Order") was released in February 2008.[24]

The new rules left the FCC's local radio and local television ownership rules, radio-television cross-ownership rules, and the so-called "dual network" rule intact. There was, however, a modest relaxation of the newspaper-broadcast rule. The previous flat ban was replaced with a case-by-case approach. Under certain circumstances, the combination of a daily newspaper and a single radio or television station in the same market is presumed to be in the public interest. However, the presumption is rebuttable.[25]

Specifically, a newspaper-broadcast combination is presumed to be in the public interest if the market in question is one of the top 20 Nielsen Designated Market Areas ("DMA") and the transaction involves one daily newspaper and only one television or radio station. Moreover, if the transaction involves a television station, then post-merger the DMA must have at least eight independently-owned and operated major media voices, and the television station involved in the merger cannot be among the top four in the DMA with respect to audience share. "Major media voices" consist of full-power television broadcast stations and major newspapers.[26]

If these conditions do not obtain, then a proposed newspaper-broadcast combination in a top 20 market is presumed not to be in the public interest. Additionally, any proposed newspaper-broadcast combination outside of the top 20 markets is presumed not to be in the public interest. The presumption is reversed, however, in two limited circumstances: when the station or newspaper is "failing" financially or has "failed", or when the proposed combination would result in a new broadcast source of local news in the market. In order to meet the new source of local news criterion, the combination would need to involve a broadcast station that was not offering local newscasts prior to the merger; after the merger, the station would have to initiate at least seven hours per week of local news programming.

[24] 23 FCC Rcd 2010 (2008)

[25] See Ibid, paras. 53-75 for a detailed description of the rule, the presumptions, and the rationale.

[26] The Commission referenced Study 1 (of the 10 it commissioned) "How People Get News and Information" prepared by Nielsen Media Research, Inc. to support the decision to count television stations and major newspapers as major media voices. Major newspapers are newspapers published at least four days per week within the relevant DMA and that have a circulation greater than five percent of DMA households. See Id., para. 54 and footnote 183.

In any case, the presumption, either positive or negative, is rebuttable. The new regulations establish four criteria for the FCC to consider in making its findings. The FCC is to consider whether the combined entity will significantly increase the amount of local news in the market; whether the newspaper and the broadcast station with which it is to be combined will continue to employ their own staffs and to exercise their own independent news judgment; the level of concentration in the relevant DMA, and the financial situation of the broadcast station or newspaper (if one of them is in financial distress, the FCC will consider the commitment of the proposed owner to invest significantly in newsroom operations).

In reaching this decision, the FCC evaluated the likely effects of cross-ownership on competition, localism, and diversity. With respect to competition, the 2006 Quadrennial Review Order reaffirmed the finding of the 2002 Biennial Review Order that "for purchasers of advertising time, newspapers, television, and radio are not good substitutes and therefore make up distinct product markets," and noted that this product market definition was not challenged on appeal. This led the Commission to reaffirm the conclusion that "newspaper/broadcast combinations cannot adversely affect competition in any relevant product market."[27] With respect to localism, they supported the proposition that "cross-ownership can promote localism by increasing the amount of news and information transmitted by the co-owned outlets."[28] With respect to diversity, the Commission reaffirmed the conclusion of the 2002 Order that "retaining some cross-ownership limits is necessary in order to ensure diversity," further noting that the Prometheus court had agreed with this conclusion.[29] Moreover, the Commission stated that it "is not in a position to conclude that ownership can never influence viewpoint" and that it is "not in a position to quantify nontraditional media outlets' contribution to diversity." This led the Commission to conclude that its diversity goal would be served by a flexible newspaper-broadcast cross-ownership limit, rather than a flat ban.

The Role of Research The primary role of research in helping reach these conclusions was in shedding light on the impact of cross-ownership on localism – in particular, on the provision of local news.[30] The Commission noted the availability of "a considerable amount of empirical evidence in the record on both sides concerning the relationship between newspaper/broadcast combinations and localism," and stated that "[O]n balance ... the evidence suggests that some newspaper/broadcast combinations can enhance localism."[31]

[27] Id., footnote 131.

[28] 2006 Quadrennial Review Order, para. 46.

[29] This diversity discussion is found in 2006 Quadrennial Review Order, paras. 47, 49, and 50.

[30] The Commission's analysis of the impact of newspaper-broadcast cross-ownership on localism draws both on examples provided by commenters that assertively demonstrate that additional news is provided as a result of cross-ownership and on systematic statistical analysis.

[31] 2006 Quadrennial Review Order, para. 42

In reaching this conclusion, the FCC drew primarily on three of its economic studies. Study 3, "Television Station Ownership Structure and the Quantity and Quality of TV Programming" was produced by Gregory Crawford. Section I of Study 4, "News Operations: The Impact of Ownership Structure on Television Stations' News and Public Affairs Programming" was produced by Daniel Shiman. Study 6, "The Effects of Cross-Ownership on the Local Content and Political Slant of Local Television News," was produced by Jeffrey Milyo.[32] The FCC also examined empirical submissions from other parties, notably the Consumers Union (CU). In addition to the studies that the FCC commissioned and the comments of interested parties, the Commission also had access to "peer reviews" of these studies and submissions. The Commission solicited these reviews from outside experts, pursuant to U.S. Office of Management and Budget (OMB) procedures that took effect in 2005.[33]

The studies sponsored by the Commission found evidence that *individual* television stations that are cross-owned with a newspaper in the same market offer more local news programming than do stations that are not cross-owned.[34] By contrast, CU performed its own analysis of the data used in the FCC studies, claiming to have taken into account the critiques from the peer reviews. Among the conclusions of CU's analysis was that "newspaper/television combinations do not increase the *total* quantity of local news in the market."[35] [Emphasis added]

The Commission evaluated the three studies that it had commissioned, taking into account the peer reviews and the authors' responses to the peer review, concluding that the three studies were, in fact, reliable.[36] The Commission also examined the CU analysis, and the critique thereof, and concluded that it "cannot rely on its conclusions."[37] After reviewing the evidence, the Commission summed up by stating that "[W]e recognize that there is disagreement in the studies. On balance, however, we conclude that the weight of evidence indicates that cross-ownership can promote localism by increasing the amount of news and information transmitted by the co-owned outlets."[38]

[32]The studies (and related materials) are available at `http://www.fcc.gov/ownership/studies.html`. The three studies are summarized in Connolly and Kwerel (2007, 107-120).

[33]OMB requires that influential scientific information on which a Federal Agency relies in a rule-making proceeding be subject to peer review to enhance the quality and credibility of the government's scientific information. See OMB Peer Review Bulletin, 70 Fed. Reg. 2664; available at `http://www.fcc.gov/omd/dataquality/peer-omb-reqs.pdf`.

[34]See Connolly and Kwerel's (2007, pp.111-112) discussion of Crawford (2007), Milyo (2007), and Shiman (2007).

[35]In turn, their analysis was critiqued in a submission on behalf of Media General. 2006 Quadrennial Review Order, paras. 43-44.

[36]Id., para. 42 and associated footnotes. As detailed therein, Shiman and Milyo provided responses, implementing revisions in response to the peer reviews.

[37]Id., para. 44; in para. 45, the 2006 Quadrennial Review Order also reviews a study by Michael Yan and the critiques thereof.

[38]Id., para 46.

Subsequent Developments The Commission's decision was appealed by various parties; that appeal is currently pending.[39] Moreover, resolutions of disapproval have been passed by the U.S. Senate and by the House Appropriations Committee. If the Congress were to pass a resolution of disapproval and the President were to sign it or if it were passed over a presidential veto, the 2006 Quadrennial Review Order rules changes would be invalidated. In the meantime, the clock continues to tick and, pursuant to Congressional requirements, the Commission will review broadcast ownership rules again in 2010.

4 Quality-Adjusted Cable Prices

4.1 Background

A topic of recurring interest at the Commission are prices for cable television services. In the last 25 years, cable prices have been de-regulated (1984 Cable Act), re-regulated (1992 Cable Act), and de-regulated again (1996 Telecommunications Act).[40] At the same time, competitors to cable systems have grown: first in the form of Direct Broadcast Satellite (DBS) systems (DirecTV, Dish Network), and more recently with the entry of local telephone systems (Verizon, AT&T) in some cable markets.

Irrespective of these changes in market developments, cable prices continue to rise. Marx (2006), in her survey of the industry two years ago, described the patterns in industry prices reported in the Commission's annual Cable Price Reports. Figure 3, from Marx (2006), documents the increase in prices for a variety of communications services between 1995 and 2005. It reports the average price of overall, long-distance, international, and wireless telephone services, the average price of Expanded Basic cable services, and (for comparison purposes) the U.S. Consumer Price Index (CPI).[41] The differing trends in prices for cable versus telephone services are striking. Nominal prices for telephone services have fallen across the board, sometimes by as much as 80%. This is in stark contrast to prices for Expanded Basic cable service: Figure 3 reports that average prices for Expanded Basic cable service rose from $22.35 in 1995 to $43.04 in 2005, an increase of 92.6%.

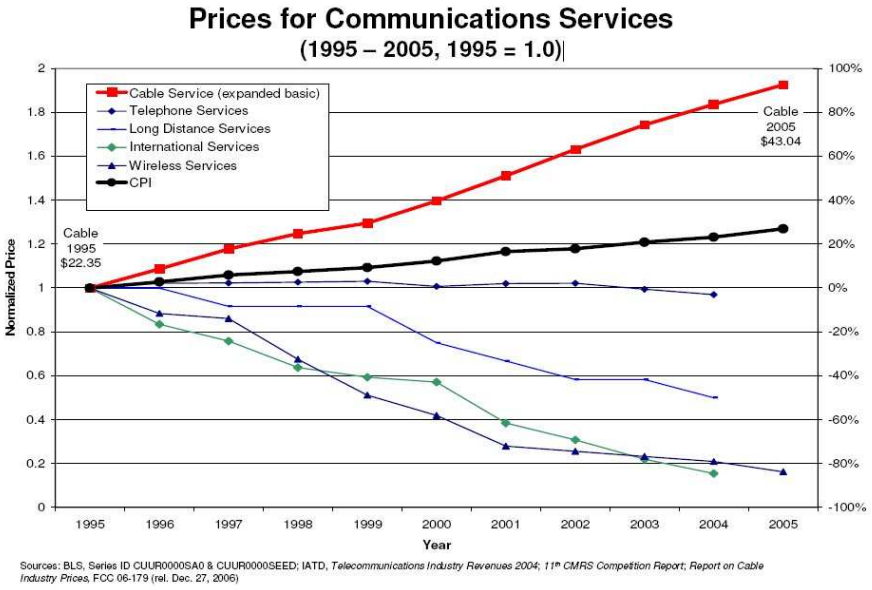
What is driving these differences? Similar factors appear to be present on the supply side. The widespread rollout of fiber-optic cable and advances in multi-plexing technology have (at times dramatically) reduced distribution costs (as well as increased capacity). So too has competition within and between various service providers increased. The primary difference is in content: Unlike telephone services, cable systems select and distribute content (programming networks) of

[39] 2006 Quadrennial Review Order, petitions for review pending, Media Alliance v. FCC, No. 08-70830 (9th Cir.).

[40] See Crawford (2006) for a survey of the recent regulatory history of and market trends in the industry.

[41] The CPI is a useful benchmark for cable (or any) prices as it documents the general trend in the prices faced by consumers.

Figure 3: Prices for Communication Services



value to households, and both the number of these networks and the amount that they spend on programming (which is passed on as costs to cable systems) have increased.[42] Thus the quality of cable service have surely increased. Are then consumers better or worse off?

4.2 Quality-Adjusted Price Measurement in General

Measuring the net effect of rising prices and quality is a well-known, but challenging, economic problem. A simple two-period example provides the intuition: Suppose that prices and quality are low in the first period and high in the second. To determine if households are better or worse off, one would like to measure the aggregate consumers surplus (i.e., "consumer welfare") from facing the low-price, low-quality service and compare it to the aggregate consumers surplus from facing the high-price, high-quality service.

This is the basic question underlying the calculation of a cost-of-living price index, the goal for the Bureau of Labor Statistics (BLS) in its calculation of the CPI. If the demand for the indexed products is known, the calculation of a cost-of-living index is straightforward. Recent methodological developments in the analysis of demand in differentiated products markets provide the necessary

[42] See, e.g., FCC (2005b) and Kagan World Media (2008).

techniques,[43] but the data required are comprehensive, often making the exercise infeasible.[44]

In practice, the CPI measures price changes for a fixed basket of goods using either matched-model or hedonic techniques. In a matched-model approach, prices for a product are compared across time periods. If a product disappears or a new product is introduced, either organically or via rotation of the set of sampled products or outlets, the price of "the most similar" product is compared to the missing one. If the most similar product is "non-comparable", the price change is set at the average of similar products in the index and any remaining price difference is attributed to quality change. As discussed in Shultze (2003), this can either over- or under-estimate the "true" quality-adjusted price change. In the hedonic approach used by the BLS, prices for non-comparable products in the base period are imputed based on a hedonic regression of base-period prices on base-period product characteristics. The price change for the "most similar" product is then just the difference between the observed reference-period price and the imputed reference-period price. There are important challenges inherent in measuring quality change using either approach. In cable and satellite markets, the CPI uses a matched-model method to evaluate price changes, *after* adjusting those prices for changes in the number of channels that are offered on sampled products.

This section abstracts from these issues to propose a simple alternative measure of quality-adjusted cable prices. Rather than base measured cable service quality on the number of offered channels (as done by the CPI), we base quality on the number of hours that people spend watching those channels and calculate a cable Price-Per-Viewing-Hour (PPVH). There are both advantages and disadvantages to this approach. The primary advantage is that the presence of more channels and higher-cost (quality) programming on those channels should matter to households to the extent that having access to them translates into watching more television. Furthermore, calculating a price-per-network would be appropriate only if each network were equally valued (on average) by households, something ratings data easily refutes. Disadvantages include not measuring the benefits to households of reallocating viewing to preferred networks and the fact that other factors besides cable service quality can also influence viewing hours (e.g., prices of substitutes and/or complements). On balance, we believe viewing hours to be the better cable quality measure.[45] We take comfort that we are not alone in our choice.[46]

Why should one bother constructing a measure of quality-adjusted cable prices? Shouldn't effort

[43] The basic idea is to estimate how households trade off price and quality changes and estimate the consumer surplus (welfare) effects of such changes. From these, one can construct an "exact" cost-of-living (price) index to measure how much more or less households would be willing to pay to face services of different prices and/or qualities. See, e.g., Pakes, Berry, and Levinsohn (1993) and Petrin (2003) for the general principles and Crawford (2001, 2008) for applications of these techniques to cable markets.

[44] In addition to price and quality attributes, it is critical to have market shares as well as additional, often cost-side, variables ("instruments") that can help identify the structure of demand.

[45] Crawford (2008a) compares the two approaches, highlighting potential biases in each.

[46] Both the National Cable Television Association (NCTA (2008)) and industry analysts (Bernstein Research (2007)) also adjust cable prices by viewing hours.

instead be devoted to accurately measuring the underlying demand curves necessary to construct a true cost-of-living index? Or use hedonic techniques to quality-adjust cable prices? Our answer is "Yes, but...": Effort *should* be devoted to the collection and analysis of the data necessary to study simultaneous price and quality changes,[47] but at the same time it is useful to have an easy-to-communicate and understand (if crude) measure of quality-adjusted cable prices. While imperfect, a cable PPVH is easy to calculate using aggregate data and (we hope) provides insights into the likely sign (if not the magnitude) of consumer welfare effects from simultaneously rising cable prices and qualities.

4.3 Price Per Viewing Hour

Weighted Average Cable Price Before introducing the price-per-viewing-hour, it is important to ensure that we are measuring the appropriate price(s). Most previous work in cable markets have analyzed the price of Expanded Basic (EB) service. This is defined by the FCC as the combination of two component services: Basic (B) service (typically providing all local broadcast and public, educational, and government channels), and Cable Programming (CP) service (typically providing the advertising-supported program networks – e.g. ESPN, MTV, and CNN – commonly associated with cable television).

In practice, Expanded Basic cable prices likely *understate* cable expenditure increases for most households. By January 2005, over 40% of cable households subscribed to a Digital (D) tier of service.[48] Accounting for this trend, Crawford (2008a) defines the **Weighted Average Price** (WAP) of cable service as the average price of Expanded Basic service plus Digital service (where Expanded Basic service is the combination of Basic service and Cable Programming service), with the price of Digital service weighted by the share of Expanded Basic households that take digital.[49] Figure 4 demonstrates this. The lower line reports the average price for Expanded Basic (B+CP) service; this is analogous to the cable line in Figure 3. The upper line reports the average price for Expanded Basic and the most popular Digital (B+CP+D) service, and the middle line is the Weighted Average Price of cable service. Driven both by increases in the price of digital service and the share of households that take it, the WAP of cable service has grown from $22.35 in 1995 to $48.44 in 2005: This is an increase of 116.7%, which is over four times the 25.0% increase in the

[47] There has been some previous research into this issue: Crawford (1998) calculates a cost-of-living index, and Anstine (2001) and Brown and Uri (2004) conduct hedonic analyses in cable markets. Further work would be welcome.

[48] A digital tier is a tier of service consisting of a bundle of networks that are distributed in digital (versus analog) format. Crawford (2008a) reports the share of Expanded Basic households purchasing "the most highly subscribed digital tier".

[49] Note that this calculation considers cable households that take at least Expanded Basic (Basic + Cable Programming) service. Thus it does not account for those households that just take Basic Service. The share of such households is typically around 12% (e.g., FCC (2006a)).

CPI over the same period.

For the purpose of calculating quality-adjusted cable prices, it is also important to include Digital tiers, since a non-trivial portion of cable viewing hours happens on networks primarily or exclusively offered on Digital services. We do so next.

Figure 4: Weighted Average Price of Cable Service

Source: B+EB Prices: FCC (2006a), FCC (2007a); D Prices: FCC (2000), FCC (2001), FCC (2004a), FCC (2005a), FCC (2006a), Crawford (2008a); D Share (for weighting): Crawford (2008a).

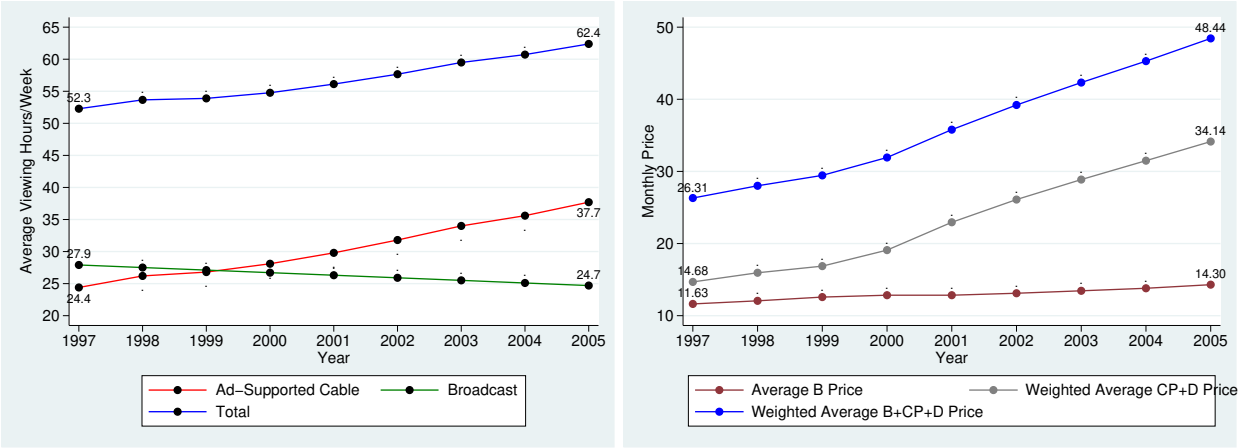
Price Per Viewing Hour (PPVH) The left panel of Figure 5 documents the trend in viewing hours among cable and satellite households of the networks offered on Expanded Basic and/or Digital cable services.[50] Several patterns are evident: First, the average cable household is watching much more cable television: Average viewing of ad-supported cable networks has risen from 24.4 to 37.7 hours/week, an increase of 54.5%.[51] Furthermore, this viewing is (in part) coming at the expense of broadcast television: Estimated average viewing of broadcast networks among cable

[50] Information about average viewing hours/week on ad-supported cable networks is from the Cable Advertising Bureau (CAB). Values are for the Cable Plus Nielsen universe, defined as "the households in the Total U.S. that can receive cable programming via wired cable or other means" (Nielsen Media Research (2004, p.B)). Values from 2002 to 2005 are from `http://www.onetvworld.org/main/cab/fasttrax/average-time-spent-with-c.shtml`; values from 1997 to 2001 are from Wildman (2003). Information about average viewing hours/week for *broadcast* networks is also from the CAB, though less cleanly. See Crawford (2008a) for details. In what follows, we use only ad-supported cable hours to calculate a PPVH.

[51] This is driven by increases in the number of households that subscribe to cable and satellite television as well as by migration of new and existing subscribers from broadcast to cable networks.

households has fallen from 27.9 to 24.7 hours/week, a decrease of 11.5%. Overall, the rise in cable viewing is greater than the fall in broadcast viewing, yielding an overall increase in viewing of (ad-supported) television networks among cable households of 52.3 hours/week in 1997 to 62.4 hours/week in 2005, or an increase of 19.3%.

Figure 5: Average Cable Prices and Viewing Hours/Week



Given viewing hours, there are two ways to calculate a Price Per Viewing Hour: one using *Total* prices and viewing, and one using *Incremental Cable* prices and viewing.[52] Due to difficulties in obtaining historical viewing hours of broadcast networks, we use the one based on incremental prices and viewing; both yield similar results.[53] Formally we define PPVH as

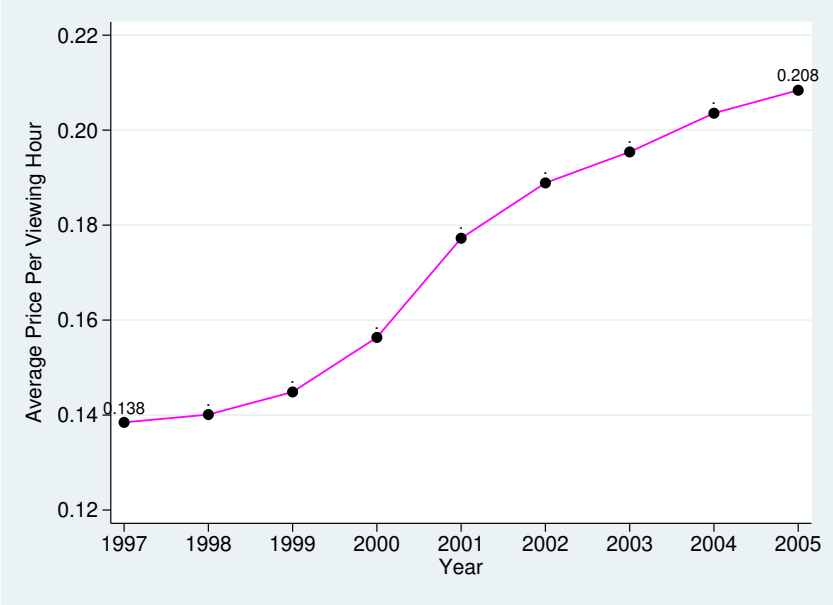
$$\text{PPVH} = \frac{\text{Weighted Average Price of CP+D Service}}{\text{Ad-Supported Cable Hours}} \tag{1}$$

The right panel of Figure 5, from Crawford (2008a), splits the WAP of cable service into the average price of Basic service and the weighted average price of Cable Programming and Digital service that is necessary to calculate Equation (1). Figure 6 demonstrates the average Price Per Viewing Hour using this equation. Average price per viewing hour has increased from 13.8 cents/hour in 1997 to 20.8 cents/hour in 2005, an increase of 50.7%, more than two and a half times the 18.8% increase in the CPI.

[52]Total Price is the WAP: the average price of Expanded Basic service plus Digital service, with the price of Digital service weighted by the share of Expanded Basic households that take Digital; Total Viewing is broadcast viewing hours plus ad-supported cable viewing hours; Incremental Prices is the average price of Cable Programming service (i.e., that part of Expanded Basic service that *excludes* Basic service) plus Digital service, with the price of Digital service weighted by the share of Expanded Basic households that take Digital; Incremental Viewing is ad-supported cable viewing hours. Crawford (2008a) introduces and discusses the two methods in more detail.

[53]Indeed, the measure based on Incremental Prices and Viewing yields the more conservative estimate of increases in quality-adjusted cable prices.

Figure 6: Average Price Per Viewing Hour



4.4 Conclusions and Implications

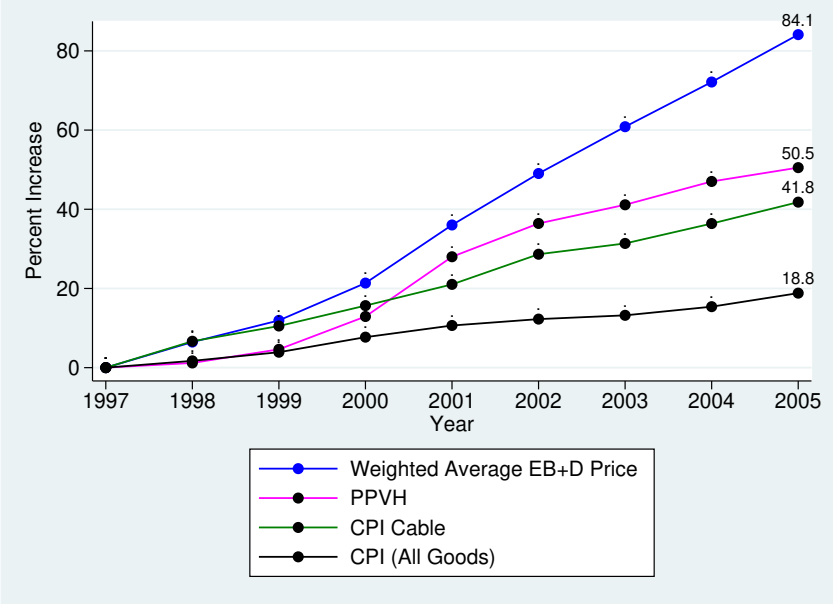
Figure 7 summarizes our results. It presents our preferred estimates of raw (unadjusted) cable prices (the Weighted Average Price of cable service), our measure of quality-adjusted prices (PPVH), and the the general trend in prices for all goods (CPI All Goods) between 1997 to 2005. As expected, raw (unadjusted) cable prices rise fastest, by 84.1% over the 8-year period. Our quality-adjusted measure, with an increase of 50.5%, shows smaller but still significant quality-adjusted price increases. Both are significantly higher than the 18.8% increase in the CPI over the same period.[54] The conclusion is clear: Whether on an unadjusted or quality-adjusted basis, cable prices have been rising far faster than inflation. While this is not the same as measuring the consumer welfare effects of simultaneously rising prices and quality, at a minimum it suggests that consumers are not necessarily better off in 2005 than they were in 1997. Further research quantifying the welfare effects of price and quality changes in cable markets would be welcome.

Taking this as the premise, there remains the question of what can or should be done about rising cable prices. Promoting competition in video markets is primary, and the FCC has a number of matters that touch on this issue, including promoting uniform franchising standards[55] and ensuring that video operators do not discriminate against rivals that distribute video content through those

[54] As is the CPI's cable price series. It adjusts for quality on a per-channel basis and shows a 41.8% increase in the same period. See Crawford (2008a) for further comparisons between PPVH and the CPI cable price index.

[55] FCC (2007c)

Figure 7: Change in Cable Prices Over Time on a Raw and Quality-Adjusted Basis



operators broadband pipes.[56] The FCC is also considering the consumer welfare consequences of tying and/or bundling in both the wholesale and retail markets.[57] This remains an important area of concern for both consumers and the Commission.

5 Leased Access

On June 15, 2007, the Commission released a Notice of Proposed Rulemaking in the matter of Commercial Leased Access (CLA) requirements facing cable television systems (FCC (2007b)). The CLA requirements were introduced by the 1984 Cable Act and require a cable operator to set aside channel capacity for commercial use by unaffiliated video programmers. The 1992 Cable Act required the FCC to set maximum rates that cable operators could charge such programmers. In implementing this directive, the FCC set a maximum rate formula for full-time carriage on all programming tiers that had subscriber penetration greater than 50%. These rates were based on the "average implicit fee" that other programmers were charged for carriage on those tiers.[58] Cable

[56] FCC (2008a).

[57] The FCC has published two reports analyzing à la carte pricing (FCC (2004b), FCC (2006b)) and is examining the issue of wholesale tying (FCC (2007d)). In the economics literature, Crawford (2008b), Crawford and Yurukoglu (2008), and Yurukoglu (2008) attempt to quantify the consumer welfare benefits of à la carte sales of cable networks to households in cable markets.

[58] See Second Report and Order (SRO), 12 FCC Rcd 5267, 5283 (1997). The SRO also set rates for channels that are offered on an à la carte basis based on the "highest implicit fee" that other programmers are charged. In this

operators were permitted to use any unused channel capacity designated for leased access.

In the years after these rules, very few programmers signed up for carriage via leased access.[59] Their primary complaint was that the "average implicit fee" yielded a rate for leased access that was far higher than they could expect to recoup by either advertising or subscriber revenue. A maximum rate based on an average implicit fee is also hard to justify on economic grounds. If the goal is to ensure that the cable operator is insulated from lost profits by providing channel capacity to a leased access programmer, then the relevant object of interest is the operator's opportunity cost of carrying the last network that it offers. In other words, the maximum price should be set equal to an operator's **Marginal Opportunity Cost**, not its Average Opportunity Cost.

On February 1, 2008, the Commission released a Report and Order and Further Notice of Proposed Rulemaking that, among other things, implemented this change (FCC (2008b)). It defines the operator's marginal channels as the last channels that are carried by the cable system and the marginal implicit fee as the operator's average net revenue from those channels. It then uses the marginal implicit fee to set the maximum leased access rate, subject to an overall cap of \$0.10.[60,61]

The set of channels over which the operator averages depends on the channel capacity of the system.[62] Channels that the cable operator is mandated to carry (as for must-carry and Public, Educational, and Government channels) were excluded from the calculation.

Cable operators immediately challenged the new rules, arguing that they would face irreparable harm if the rules were implemented. Their core argument was that for some (many) systems and tiers, the maximum leased access rate would be zero.[63] The U.S. Court of Appeals for the Sixth Circuit stayed the order in May, 2008.[64] Whether leased access rates can be revised while retaining their character as marginal opportunity costs remains to be seen.

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section, we focus on the rates charged for networks carried on programming tiers.

[59] FCC (2006a, Par. 9) reported that the average cable system carried 0.7 leased access channels.

[60] This is a non-trivial calculation, even for cable systems. The challenge arises from the fact that revenues from networks that are offered in tiers are not disaggregated by network (even if costs are). The Order solved this problem by calculating an average mark-up for each tier that is subject to the leased access provision as the total revenue of that tier less the operator's total costs from that tier. It then applies that markup to the per-subscriber affiliate fee associated with each network offered in the tier. Appendix D in the Order provides a simple motivating example.

[61] An overall cap was important as the new structure might create incentives for cable operators to game the system with tier design, particularly for tiers with many mandated-carriage channels and few non-mandated-carriage channels.

[62] The leased access set-aside depends on the channel capacity of the system. See SRO at Pars. 4, 45. For most systems and tiers, the average would be over the lowest 15% of activated channels.

[63] See, e.g., Request of National Cable & Television Association for a Stay, March 28, 2008, Exhibit 1 (Declaration of Melinda Witmer, Executive Vice President, Chief Programming Officer, Time Warner Cable) at Par. 4, "Based on [a] good-faith determination, it appears the new formula will for the vast majority of TWC systems produce a rate of zero or near zero."

[64] As did the Office of Management and Budget in July 2008. In an unusual event, OMB ruled that the new rule failed to take into account the additional costs, staffing, and risks to proprietary information of cable system and was thus inconsistent with the Paperwork Reduction Act.

6 Conclusion

This paper summarizes four issues of interest for economists at the Federal Communications Commission during 2007-2008. While this is only a small portion of the economic analysis conducted at the Commission, it highlights the important role that economics can play in decision-making at the Commission.

References

Anstine, D. (2001): "How Much Will Consumers Pay? A Hedonic Analysis of the Cable Television Industry," *Review of Industrial Organization*, 19, 129–147.

Bernstein Research (2007): "Weekend Media Blast: Death, Taxes... and Cable Rate Increases. A Look Beneath the Headlines," Discussion paper, Bernstein Research, December 7, 2007.

Brown, K., and N. Uri (2004): "Cable Service and Its Implicit Marginal Valuation," *Technology Analysis and Strategic Management*, 16(4), 539–560.

Brusco, S., and G. Lopomo (2002): "Collusion Via Signaling in Simultaneous Ascending Bid Auctions with Multiple Objects and Complementarities," *Review of Economic Studies*, 69(2), 407–436.

Brusco, S., G. Lopomo, and L. Marx (2008): "The Economics of Contingent Re-Auctions," Working Paper, Duke Universtiy.

Bykowsky, M., M. Olson, and W. Sharkey (2008): "A Market-Based Approach to Establishing Licensing Rules: Licensed versus Unlicensed Use of Spectrum," Office of Strategic Planning and Policy Analysis Working Paper 43.

Connolly, M., and E. Kwerel (2007): "Economics at the Federal Communications Commission: 2006-2007," *Review of Industrial Organization*, 31, 107–120.

Cramton, P. (1997): "The FCC Spectrum Auctions: An Early Assessment," *Journal of Economics and Management Strategy*, 6(3), 431–495.

Cramton, P., and J. Schwartz (2000): "Collusive Bidding: Lessons from the FCC Spectrum Auctions," *Journal of Regulatory Economics*, 17(3), 229–252.

Crawford, G. (1998): "Demand, Pricing, and Bundling: An Economic Analysis of the Cable Television Industry," Ph.D. Dissertation, Stanford University.

——— (2006): "Cable Television Regulation in the Satellite Era," Working Paper, University of Arizona.

——— (2007): "Television Station Ownership Structure and the Quantity and Quality of Television Programming," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/mbpapers.html.

——— (2008a): "Cable Television Prices," Working Paper, Federal Communications Commission.

——— (2008b): "The Discriminatory Incentives to Bundle in the Cable Television Industry," *Quantitative Marketing and Economics*, 6(1), 41–78.

Crawford, G., and A. Yurukoglu (2008): "The Welfare Effects of Bundling in Multi-Channel Television Markets," mimeo, University of Arizona.

FCC (2000): "1999 Report on Cable Industry Prices," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2001): "2000 Report on Cable Industry Prices," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2004a): "2003 Report on Cable Industry Prices," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2004b): "Report on the Packaging and Sale of Video Programming to the Public," Discussion paper, Federal Communications Commission, November 18, 2004. Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2005a): "2004 Report on Cable Industry Prices," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2005b): "Eleventh Annual Report on the Status of Competition in the Market for the Delivery of Video Programming (2004 Report)," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2006a): "2005 Report on Cable Industry Prices," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2006b): "Further Report on the Packaging and Sale of Video Programming to the Public," Discussion paper, Federal Communications Commission, February, 2006. Available at http://www.fcc.gov/mb/csrptpg.html.

——— (2007a): "2006 Report on Cable Industry Prices," Discussion paper, Federal Communications Commission, Draft internal FCC report.

——— (2007b): "Notice of Proposed Rulemaking," Discussion paper, Federal Communications Commission, FCC 07-18.

——— (2007c): "Report and Order and Notice of Proposed Rulemaking," Discussion paper, Federal Communications Commission, FCC 06-180.

——— (2007d): "Report and Order and Notice of Proposed Rulemaking," Discussion paper, Federal Communications Commission, FCC 07-169.

——— (2008a): "Commission Orders Comcast to Dnd Discriminatory Network Management Practices," Discussion paper, Federal Communications Commission, Press Release, August 1, 2008.

——— (2008b): "Report and Order and Notice of Proposed Rulemaking," Discussion paper, Federal Communications Commission, FCC 07-208.

Federal Communications Commission (2003): "Report and Order and Notice of Proposed Rulemaking," Discussion paper, Federal Communications Commission, MB Docket 02-277.

Froeb, L., P. Pautler, and H. Roeller (2008): "The Economics of Organizing Economists," mimeo, Vanderbilt University.

Hansell, S. (2007): "Verizon Wireless Says 'Bring Your Own Device'," *New York Times*, November 27, 2007.

Kagan World Media (2008): "Economics of Basic Cable Television Networks," Discussion paper, Kagan World Media.

Kwerel, E., and G. Rosston (2000): "An Insiders' View of FCC Spectrum Auctions," *Journal of Regulatory Economics*, 17(3), 253–289.

Marshall, R., and L. Marx (2007): "Bidder Collusion," *Journal of Economic Theory*, 133(1), 374–402.

Marx, L. (2006): "Economics at the Federal Communications Commission," *Review of Industrial Organization*, 29, 349–368.

——— (2008): "Comment to the FCC on Contingent Re-Auctions," Discussion paper, Duke University.

McAfee, R., and J. McMillan (1996): "Analyzing the Airwaves Auctions," *Journal of Economic Perspectives*, 10(1), 159–175.

Milyo, J. (2007): "The Effects of Cross-Ownership on the Local Content and Political Slant of Local Television News," Discussion paper, Federal Communications Commission, Available at http://www.fcc.gov/mb/mbpapers.html.

NCTA (2008): "Talking Points on Cable Pricing," Discussion paper, National Cable Television Association, Available at http://www.ncta.com/PublicationType/TalkingPoint/CablePricing.aspx, accessed March 4, 2008.

Nielsen Media Research (2004): "National Television Activity Report," Discussion paper, Nielsen Media Research.

Pakes, A., S. Berry, and J. Levinsohn (1993): "Applications and Limitations of Some Recent Advances in Industrial Organization: Price Indexes and the Analysis of Environmental Change," *American Economic Review*, 83(2), 240–246.

Petrin, A. (2003): "Quantifying the Benefits of New Products: The Case of the Minivan," *Journal of Political Economy*, 110(4), 705–729.

Shiman, D. (2007): "The Impact of Ownership Structure on Television Stations' News and Public Affairs Programming," Discussion paper, Federal Communications Commission, Media Ownership Study #4, Section 1. Available at http://www.fcc.gov/mb/mbpapers.html.

Shultze, C. (2003): "The Consumer Price Index: Conceptual Issues and Practical Suggestions," *Journal of Economic Perspectives*, 17(1), 3–22.

U.S. Department of Justice (2006): "Ex Parte Commenets," Discussion paper, U.S. Department of Justice.

Wildman, S. (2003): "Assessing Quality-Adjusted Changes in the Real Price of Basic Cable Service," Discussion paper, Michigan State University.

Yurukoglu, A. (2008): "Bundling and Vertical Relationships in Multichannel Television," mimeo, NYU Stern.